How can we protect fuel and water battlefield distribution systems over 100s miles in the future?

Long-Range Relay Capability (360 NM)

What are the Force Protection Systems available to protect and defend CSS assets in the future?

How do:

- we protect a 220+ miles of tactical pipeline (s)?
- we protect CSS SOLDIERS at remote locations?
- we protect tactical terminals with millions of gals of fuel?
- we protect water production at remote locations?
- we protect hundreds of miles of main supply

Can it:

- provide a long-range protection capability?
- provide real time surveillance of support systems
- provide immediate intelligence and force protection?
- travel 100s miles remain on station for hours in one area?
- haul emergency repair parts, fuel and water

Unmanned Aerial Vehicle Systems

Army Petroleum Core Steering Group

UAVS Overview Brief

2003

Army UAV Systems

October 2003

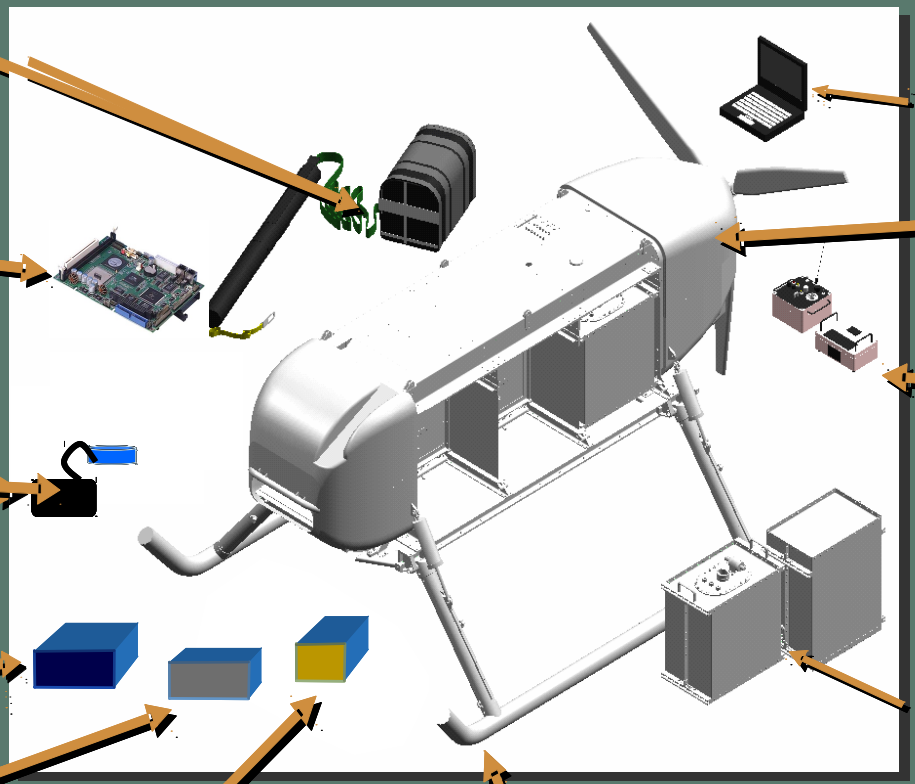
"UAVS-Protecting the Point"

Options:

- Air Launched Extended Range Transporter (ALERT)
- Shadow 200
- Fire Scout
- Hunter
- ER/MP
- Small UAV
- I-GNAT
- FCS UAV Systems
- UCAR
- A-160
- One System Ground Station
- Weaponization

ALERT, *Advance Concept Tech Demo*

Air Launched Extended Range Transporter



Ram Air Parafoil

Onboard Processor

Iridium Data Link

IFF

LOS Data Link

Wireless Network

Ground Control Station

Engine

LOS Manual Control

Fuel and Payload Modules

Landing Gear

Ground Launch Sequence

ALERT *ACTD*

Air Launched Extended Range Transporter

ALERT *ACTD*

Air Launched Extended Range Transporter

- Pre-planned, autonomous missions
  - Multiple sensors: EO/IR/LRF/ Meteorological
  - Communications Relay: VHF/UHF/C-band
  - PSYOPS/Civil Affairs: Leaflets/AM/FM/TV
  - Resupply: Emergency medical, ammo, food…
- Long loiter time (>20 hours with 150 lbs payload)
- Large payload (850 lbs combined fuel and payload)
- Multiple data links for information dissemination and Command and Control.
- Operational altitudes up to 20K feet MSL
- Multiple separate payloads, simultaneous missions
- Operable by any tasked unit, low training overhead
- Rapid turn-around for next mission

Cost: $250 to $350 ea.

"UAVS-Protecting the Point"

Shadow 200 UAV

Mission: Army tactical level reconnaissance, surveillance, target acquisition, and battle damage assessment

Shadow	
Flights	2472
Hours	6039.4

Characteristics / Description:

Wing Span

13 feet

Weight

350 lbs

Range

~ 125 km

Airspeed

(70 kt loiter, 105 kt dash)

Altitude

14,000 Ft

Endurance

> 4 Hours @ 50 km

Primary Payload(s)

EO / IR (up to 60 lb)

Capabilities :

- Automatic Landing and Takeoff
- System and Maintenance Section transportable on 3 C-130s
- Early entry capability with 1 C-130
- Compatible with ABCS
- EO / IR Sensor

Contractor

- AAI Corporation (Prime)

Unit Composition

- Platoon Set = a System:
  - 22 Soldiers (2 Officers, 20 Enlisted)
  - 4 Air Vehicles
  - 6 - HMMWVs (Ground Control Station, vehicle transport, troop transport, maintenance shelter)
  - 3 - Trailers (equipment, launcher)
  - 4 - Remote Video Terminals

"UAVS-Protecting the Point"

Shadow 200™ System

System

Ground Data Terminal x 2

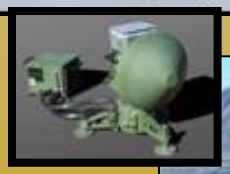
Ground Control Stations x 2

Remote Video Terminal & Antenna x 4

Portable Ground Control Station & Data Terminal

Air Vehicles with Payloads x 3

Arresting Net



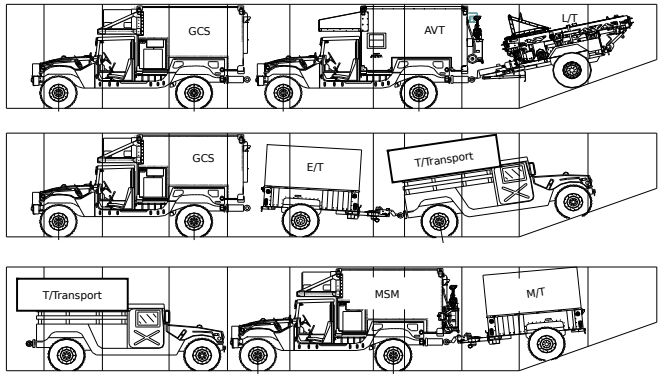
TALS

Air Vehicle Transport & Launcher Trailer

Personnel
1 x 35D (Platoon Leader)
1 x 350U (UAV Warrant Officer)
1 x 96U (Platoon Sergeant)
12 x 96 U (Air Vehicle Operators)

Deployability / Transportability

C130 Transportable



Equipment Trailer

Personnel/ Equipment Transport

Maintenance Section

Air Vehicle

Personnel/ Equipment Transport

Equipment Trailer

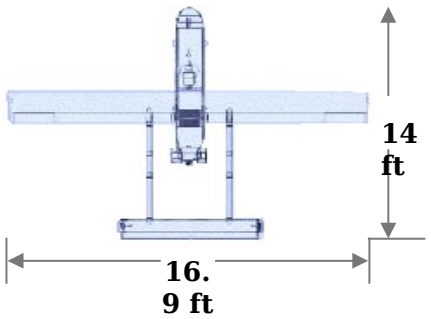
Maintenance Section Multifunctional

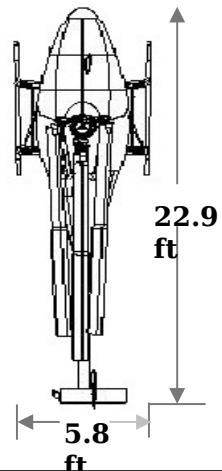
Personnel
4 x 33W (EW System Repairer)
3 x 52D (Engine Mechanic)

Shadow Fielding and Deployment Summary

- **10 TUAV systems fielded to date**
  - **6 to operational units**
  - **4 to UAV Training Center**
- **2 TUAV systems to be fielded to Korea (2ID) by 4QFY03**
- **9 TUAV systems scheduled for fielding during FY04**
- **20 TUAV systems remaining to be fielded beyond FY04**
- **2 TUAV systems supporting OIF totaling 445 sorties and 1818.7 flight hours**
- **2 additional TUAV systems scheduled for deployment before end of CY03**
- **Overall TUAV program flights total 2325 sorties and 5591.2 flight hours**

Fire Scout Relative Size





Fire Scout Sensor / Payload Options

Hellfire

APKWS
(Advanced Precision Kill Weapon System)

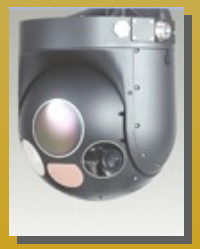
BAT
(Brilliant Anti_Tank)

OCSW
bjective Crew Served Weapo

LOCAAS
(Low Cost Autonomous Attack System)

Comm Relay
2 ARC-210s
(Standard)

Other Candidate Sensors:
- ***NBC***
- ***SIGINT***
- ***ESM***
- ***FOPEN***
- ***Expendables***



BrightStar
(EO/IR/LDRF)

COBRA
(Mine Detection)

TUAVR / Lynx
(SAR/MTI)

Skywatch
(TCAS)

Other Candidate Sensors:
- ***ALMDS Lite (Mine Detection)***
- ***Wide-Band Data Relay***
- ***Bi-Static Source Charges***

RQ-8 Fire Scout

Characteristics / Description:

Length	22.9 ft
Weight	2,650 lbs
Rotorspan	27.5 ft
Payload	300 lbs
Ceiling	19,000 ft
Radius	150 nm
Endurance	5+ hrs
Sensors	Video EO/IR & Laser Designator

RQ-8 Fire Scout Characteristics

- Mission – Intelligence, surveillance, and reconnaissance for operations ashore and afloat
- Control – Autonomous through Ground Control Station using Tactical Control System and the Tactical Control Data Link

Army Program

- Five (5) Air Vehicles
- Four (4) Ground Control Stations
- Repair and Spare Parts

Northrop Grumman Private / Proprietary Level I

Fire Scout Performance Characteristics

Threshold Requirement	Compliance
Operations from All Air Capable Ships/Unprepared fields	Yes
Target Location Error (< 25meters)	3-5m*
Ceiling / Air Speed (15,000ft / best msn speed)	19,200 ft/110 kts
Time on Station at 110nm (3 hrs 1 AV/12 hrs Syst.)	4.0+ hrs/Yes**
Secure on Deck	Yes
Heavy Fuel (JP-5/8)	Yes
Pass Control Between Control Segments	Yes
4000 ft HOGE (Full Fuel and 200 lb. MMP)	Yes
Automatic Launch/Recovery (+/- 3 degrees Pitch, +/- 5 degrees Roll)	Yes
Provide EO/IR Laser Designator/Range Finder	Yes
Integral Communications Relay	Yes
Interoperable Through TCS	Yes

* 3-5m GCS & TCS S/W upgrade ** Rotor Upgrade

Northrop Grumman Private / Proprietary Level I

One Army UAV System Approach

The system is much more than an airframe

Ground Data Terminal

TALS

Portable Ground Control Station & Data Terminal

Personnel

Launcher

Air Vehicles

Payloads

Contact Teams

APPROVED FOR PUBLIC RELEASE, DISTRIBUTION UNLIMITED

Program Overview

September 03

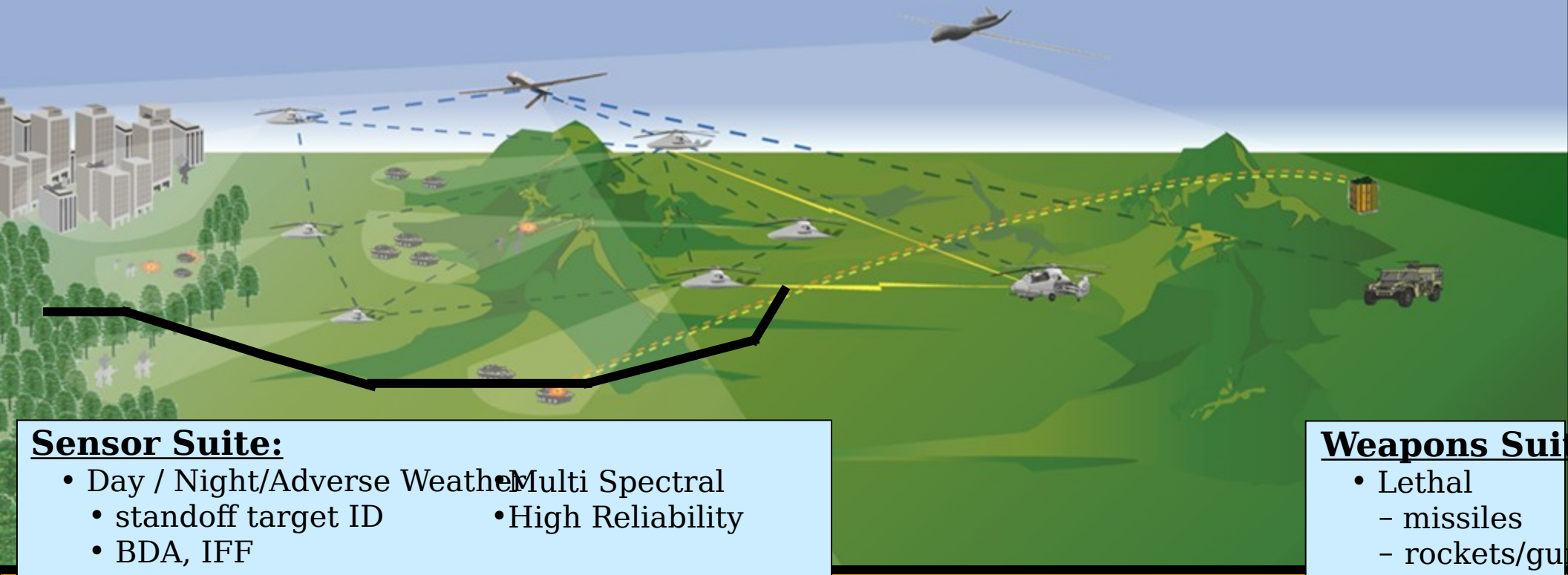
UCAR System Concept

Command & Control:

- Platform
  - Top-level mission planning
  - Dynamic retasking
  - Autonomous operation
  - Collaborative mission executi
  - Low altitude autonomous fligl

Air Vehicle:

- Day / Night & Adverse Weather
  - Similar capability to manned system
- Modular Payload
- Survivable
  - Enhance team survivability
- Performance – range, speed, end
  - Compatible w/manned system
- Affordable
  - Flyaway cost
  - O&S cost
- Robust Capability



Sensor Suite:

- Day / Night/Adverse Weather
  - standoff target ID
  - BDA, IFF
  - Distributed / cooperative
- Multi Spectral
- High Reliability

Weapons Sui

- Lethal
  - missiles
  - rockets/gu
- Non-Lethal

A160 Hummingbird Vehicle Rotorcraft Technology STO

Anticipated Performance Goals:

Range	**2500+ nm**
Endurance	**40+ hr**
Speed	**140 kt**
Hover Ceiling	**15,000 ft**
Operating Ceiling	**30,000+ ft**

Description:

Rotor Diameter

36 ft

Fuselage Length

35 ft

Features:

- Patented Optimum Speed Rotor (OSR): Varies RPM from 50% to 100% to Maximize Rotor Performance
- Low Disk Loading
- Advanced Airfoils, High Lift / Drag
- Hingeless Rigid Rotor, Hub Moment Feedback Control
- Autonomous Flight Management
- Lightweight, High Stiffness Graphite Composite Blades

Summary Questions:

- How do we protect critical battlefield support systems now?
- How vulnerable are we?
- What else can UAVs offer?
- How can we add UAVs to the log warriors capabilities?
- Can we afford and get UAV technology?